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| 09/955,858 | 09/19/2001 | Yujin Arai | 01589/LH | 9888 |

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EXAMINER

SAKELARIS, SALLY A

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| ART UNIT | PAPER NUMBER |
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1634

DATE MAILED: 07/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/955,858

Applicant(s)

ARAI, YUJIN

Examiner

Sally A Sakelaris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8 and 9 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 5/12/2004 have been entered.

Applicant's amendments and arguments have been thoroughly reviewed, but are not persuasive for the reasons that follow. Any rejections not reiterated in this action have been withdrawn in response to applicants amendments to the claims. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

While applicants' comments regarding the amendments made to the claims are acknowledged in their response to the interview of 4/20/2004, however the newly amended claims required a new search and further consideration. The new rejections below make moot any preceding arguments made in prior prosecution.

Priority

Acknowledgement of claim to foreign priority of Japanese Application, 287618, filed 9/21/2000 under 35 U.S.C. 119(a)-(d) has been made, however applicant should note that the

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translation of this foreign priority document has not yet been received and as a result the priority document cannot be relied upon to overcome the cited prior art.

Claim Objections

Claim 3 is objected to because of the following informalities: It depends from cancelled claim 2. Appropriate correction is required.

***THE FOLLOWING ARE NEW REJECTIONS NECESSITATED BY APPLICANT'S
AMENDMENTS TO THE CLAIMS***

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 3 are rejected under 35 U.S.C. 102(b) as being anticipated by Tuhro et al.(US Patent 4,471,386).

Regarding claim 1, Tuhro et al. disclose a method of image data acquisition comprising scanning a sample of originally printed characters, which includes a plurality of spots, in this case spots of ink on the original document(Claim 1) on a paper substrate with the light beam of a phase linear scanning array(Col. 3 lines 7-9); acquiring scanned image data by receiving a light from the sample; sequentially obtaining the acquired scanned image data obtained by scanning a region of a predetermined size every time a region scanned with the light reaches a predetermined size the region having a plurality of scanning lines(Col.2 lines 61-68) including a start scanning line and a stop scanning line; and (Lines 45-5 bridging Col. 5-6 and); and determining a fluorescence intensity of at least the stop scanning line, wherein if the fluorescence

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intensity of the stop scanning line is greater than a predetermined threshold(claim 1 and Col. 5 lines 5-8), a position of the stop scanning line is adjusted such that the fluorescence intensity of the adjusted stop scanning line(claim 1 (f)) is less than the predetermined threshold wherein the adjusted stop scanning line does not overlap with the plurality of spots on the substrate(claim 1(a)).

Regarding claim 3, Tuhro et al. disclose the image data acquisition method of claim 1 wherein, the sequentially stored acquired scanned image data(Col.2 lines 61-68) is stored by adding position information regarding respective scanning regions thereto in so much as the reference teaches that "each successive line that is scanned, the image signal output of the thresholding circuit 45 which represents the image area between control marks 60, 61 being discarded while the remainder of the image signals are retained and output to line 50 and the image signal user(col. 5 lines 22-27).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuhro et al.(US Patent 4,471,386) in view of Rava et al.(US Patent 5,874,219 issued 23 February 1999).

Regarding claim 4, Tuhro et al. disclose a method of image data acquisition comprising scanning a sample of originally printed characters, which includes a plurality of spots, in this

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case spots of ink on the original document(Claim 1) on a paper substrate with the light beam of a phase linear scanning array(Col. 3 lines 7-9); acquiring scanned image data by receiving a light from the sample; sequentially obtaining the acquired scanned image data obtained by scanning a region of a predetermined size every time a region scanned with the light reaches a predetermined size the region having a plurality of scanning lines(Col.2 lines 61-68) including a start scanning line and a stop scanning line; and (Lines 45-5 bridging Col. 5-6 and); and determining a fluorescence intensity of at least the stop scanning line, wherein if the fluorescence intensity of the stop scanning line is greater than a predetermined threshold(claim 1 and Col. 5 lines 5-8), a position of the stop scanning line is adjusted such that the fluorescence intensity of the adjusted stop scanning line(claim 1 (f)) is less than the predetermined threshold wherein the adjusted stop scanning line does not overlap with the plurality of spots on the substrate(claim 1(a)).

Tuhro et al. do not teach the above method of image data acquisition wherein the sample is a DNA microarray nor do they teach the method wherein an analysis processing is executed for the stored scanned image data in parallel with scanning of the next region when the storage of the scanned image data is complete.

However, Rava et al. disclose a method of image data acquisition comprising scanning a sample, which includes a plurality of spots(Col. 2 lines 3-6) on a substrate with a light beam(Col. 6 lines 5-10); acquiring scanned image data by receiving a light from the sample, and sequentially storing the acquired scanned image data; and storing the scanned image data obtained by scanning a region(defined in specification as “strip”) of a predetermined size every time a region scanned by the light reaches a predetermined size(ie. a “strip”), sequentially

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(Column 5 lines 45-56, Column 6 lines 40-53). Rava et al. disclose the image data acquisition method above wherein, the size of the scanned region by the light is changed according to an arrangement position thereof, when a plurality of measurement objects are arranged in the sample(Claims 16(b) and Claim 34(b)). Rava et al. teach in the cited claims that the size of the scanned region is changed through “the means for focusing the excitation light to a point on a substrate”(CIm 34) and further by using the “optics for directing an excitation light”(CIm 16).

Specifically regarding claim 4, Rava et al. disclose the image data acquisition method according to claim 1, wherein the sample is a DNA microarray in which a plurality of spots are arranged as a measurement object, and the size of the scanning region(strip) is such that a boundary in the scanning region is not overlapped on the spot(Column 6 lines 49-50, Column 12 lines 1-9). In referencing the specification on page 18, it appears that “boundary” is meant to define the outer edges of the region(strip) and as a result this claim’s embodiment is taught in Rava et al.’s teaching that in their method, “a strip has been scanned”(Col. 6). Applicant should note that since only a strip has been scanned, a boundary in the scanning region is not overlapped on the spot as the boundary is understood to exist outside the spots and in this example each strip(region including spots) is scanned; not a strip and a spot, or not spots overlapping the strip boundary.

Regarding claim 6, Rava et al. teach the data acquisition method of claim 1 wherein an analysis processing is executed for the stored scanned image data in parallel with scanning of a next region(strip) when the storage of the scanned image data completes(Column 6 lines 40-53). In column 6 the reference teaches that “once a strip has been scanned, the data representing the 1-dimensional image are stored in the memory of the computer” and further that “simultaneously

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scanning or imaging a strip of the sample” occurs in order to “continuously integrate and process data”(Col. 6, lines 40-53). Rava et al. do not teach the above method wherein the size of the scanning region is adjusted based on the acquired scanned image data such that boundaries of adjacent scanning regions do not overlap the plurality of spots on the substrate.

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the DNA based, parallel processing analysis of Rava et al. to the image acquisition method of Tuhro et al. for the expected benefit of “continuously integrated and processing data”(Rava et al. Col. 6, lines 40-53) which would be “advantageous in settings in which large amounts of information are required quickly, such as in clinical diagnostic laboratories or in large-scale undertakings such as the Human Genome Project”(Rava et al. Col. 1 lines 52-58).

4. Claims 5, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tuhro et al.(US Patent 4,471,386) in view of Kimura et al.(US Patent 6,458,601 B1 issued 1 October 2002) and in an even further view of the Webster Dictionary.

From above, Tuhro et al. disclose a method of image data acquisition comprising scanning a sample of originally printed characters, which includes a plurality of spots, in this case spots of ink on the original document(Claim 1) on a paper substrate with the light beam of a phase linear scanning array(Col. 3 lines 7-9); acquiring scanned image data by receiving a light from the sample; sequentially obtaining the acquired scanned image data obtained by scanning a region of a predetermined size every time a region scanned with the light reaches a predetermined size the region having a plurality of scanning lines(Col.2 lines 61-68) including a start scanning line and a stop scanning line; and (Lines 45-5 bridging Col. 5-6 and); and

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determining a fluorescence intensity of at least the stop scanning line, wherein if the fluorescence intensity of the stop scanning line is greater than a predetermined threshold(claim 1 and Col. 5 lines 5-8), a position of the stop scanning line is adjusted such that the fluorescence intensity of the adjusted stop scanning line(claim 1 (f)) is less than the predetermined threshold wherein the adjusted stop scanning line does not overlap with the plurality of spots on the substrate(claim 1(a)).

Regarding claims 5, 8, and 9 Tuhro et al. teach adjusting the size of the scanning region by regulating the number of scanning lines during the main scanning(Claim 1).

Tuhro et al. do not further teach the above methods of claims 5, 8, and 9 wherein the scanning light is performed by main scanning and sub-scanning in a direction orthogonal to the main scanning. However, the scanning of a DNA microarray chip wherein the scanning light is carried out by main scanning and sub-scanning in a direction orthogonal thereto(where orthogonal is defined as Webster to be “intersecting or lying at right angles”) was well known in the art at the time the claimed invention was made as taught by Kimura et al.(Column 4, lines 45-55) who teach a data acquisition method wherein a sub-scanning system works in a direction perpendicular to that of the main scanning system.

Therefore, it would have been *prima facie* obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the main and sub-scanner scanning approach of Kimura et al. to the data acquisition method of Tuhro et al. in view of Webster dictionary’s definition of orthogonal for the expected benefit provided by Kimura et al that “in the microarray technique, it is necessary to precisely two-dimensionally scan the microarray chip coated with cDNAs at a high density”(Kimura, Col.1).



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sally A Sakelaris whose telephone number is 571-272-0748. The examiner can normally be reached on M-Fri, 9-6:30 1st Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sally Sakelaris


7/20/2004
BJ FORMAN, PH.D.
PRIMARY EXAMINER